



FUN GAMES INC.

Rainier

BI PLANE
TM

**INSTRUCTION
MANUAL**

JANUARY 1976

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GENERAL INSTRUCTIONS

INSTALLATION:

Open back of cabinet and MAKE SURE ALL BOARDS ARE PROPERLY SEATED INTO CARD CAGE. Plug into AC Power.

PRICE PER GAME SWITCH:

Located at the top of the memory board is the price per game switch. Up is one coin per game and down is two coins per game.

GAME TIME POT:

Directly below the price per game switch is the game time pot.

WHITE PLANE SHOT RANGE POT:

Directly below the game time pot is the white plane shot range pot. Turning clockwise increases shot range. Range should be adjusted to be equal to black plane range.

VOLUME 2 POT (Location "2"):

Volume for white plane is controlled by the top pot on the *sync* board. Clockwise increases volume.

VOLUME 1 POT (Location "1"):

Directly below the volume 2 pot is the black plane volume. Operates same as volume 2 pot.

NOTE: FOLLOWING CONTROLS ARE FACTORY SET. QUALIFIED TECHNICAL PERSONNEL ONLY SHOULD ADJUST.

NOISE VOLUME:

Location #4 controls shot and boom plane relative volume.

PITCH 2:

Controls pitch of black plane motor.

tone 2:

Controls tone of black plane motor.

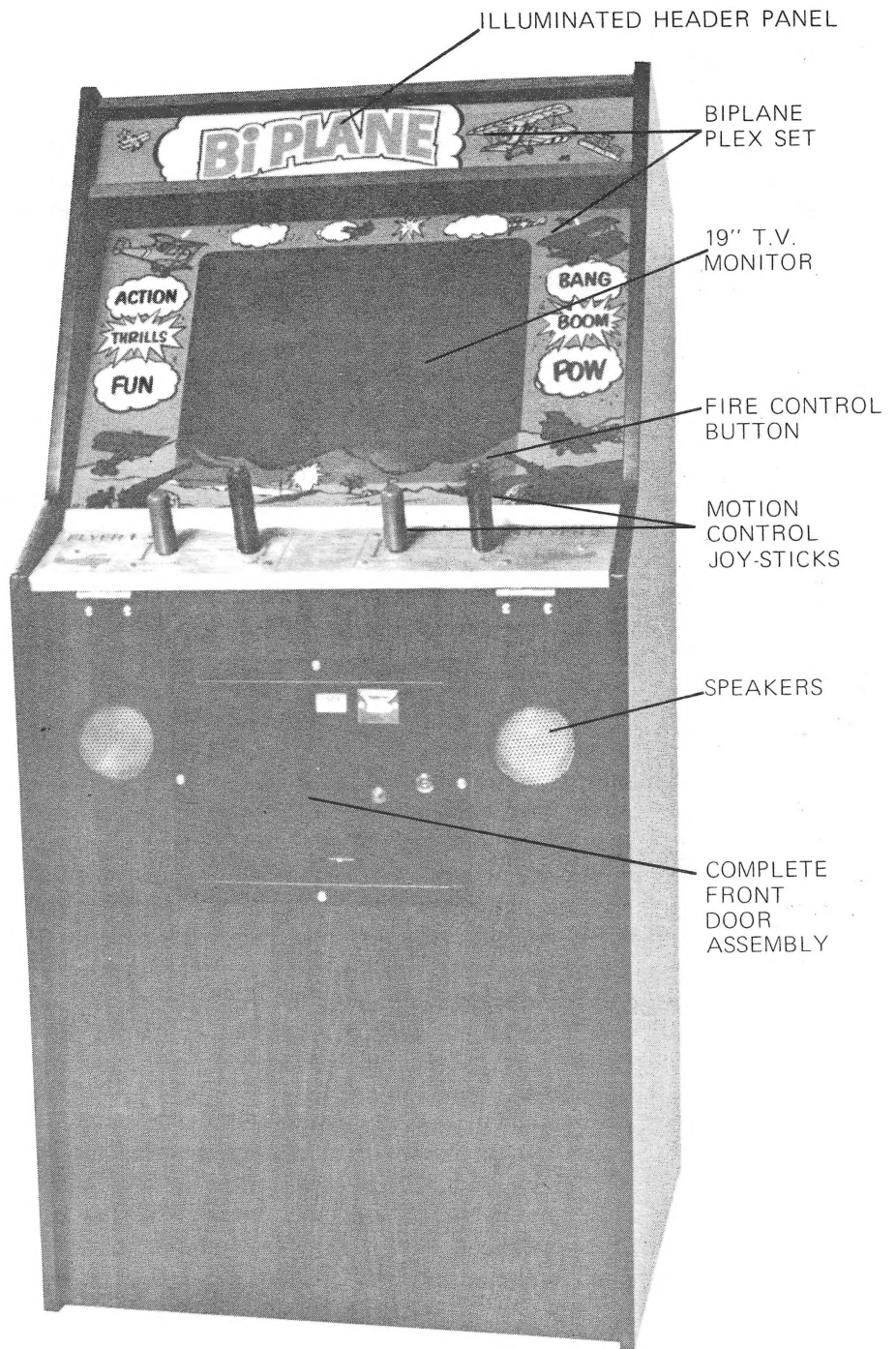
PITCH 1:

Same as pitch 2 for white plane.

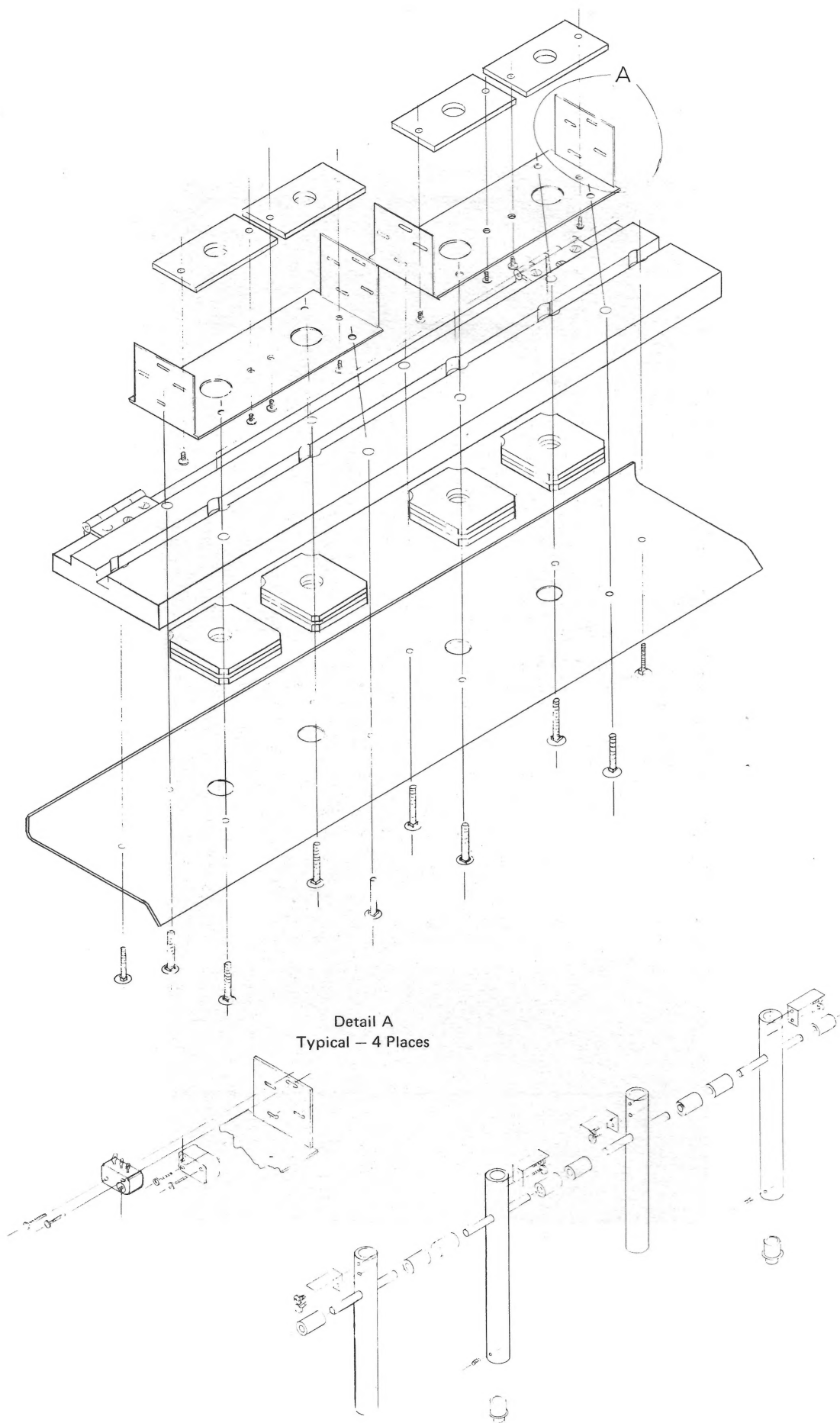
tone 1:

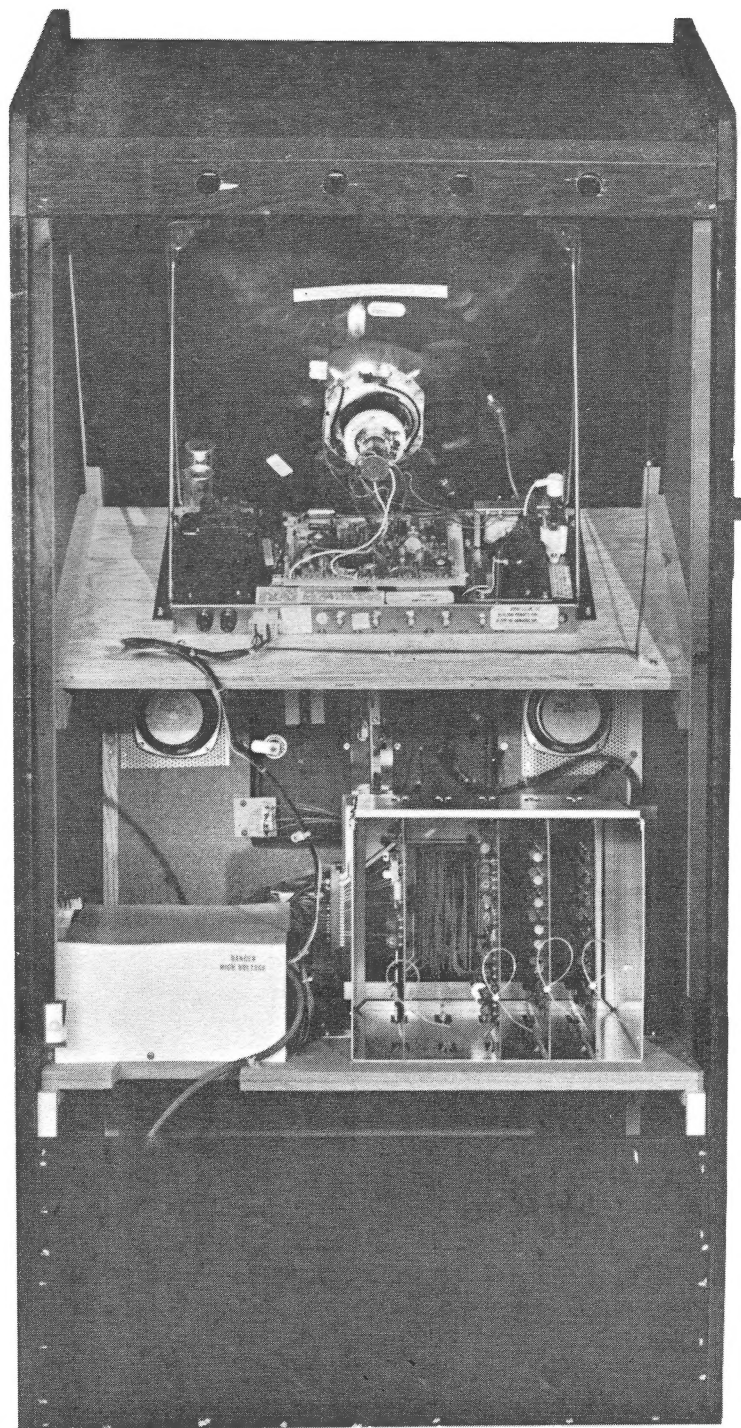
Same as tone 2 for white plane.

NOTE: BE SURE ALL BOARDS ARE PROPERLY SEATED, INCLUDING INTER-CONNECT BOARDS IN HARNESS CONNECTOR.

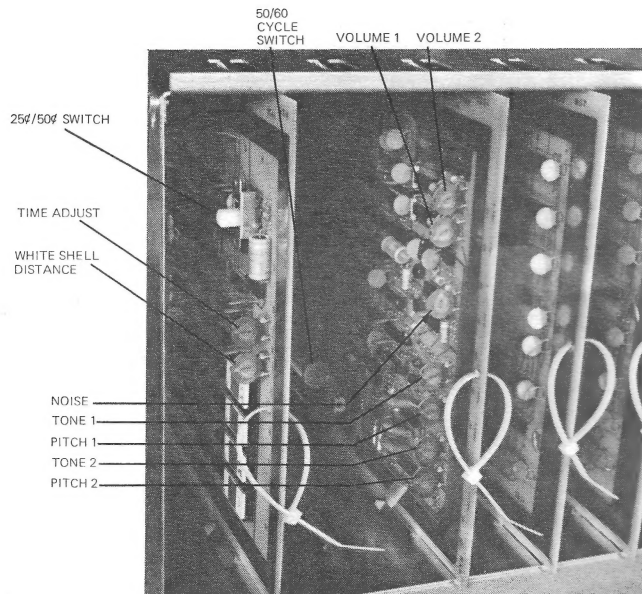
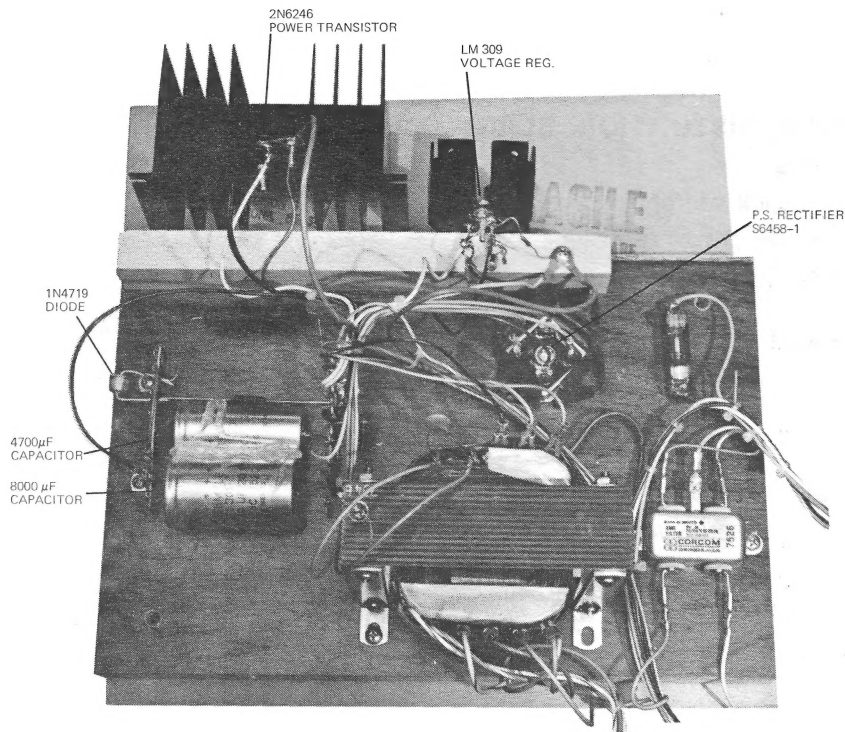


COMPONENTS AND DESCRIPTION





COMPONENTS AND DESCRIPTION



TROUBLESHOOTING GUIDE

AUDIO

1. Check speakers and connections
2. Adjust audio controls on synch board
3. Change synch board

VIDEO (RIPPLE, DISTORTION, BLANK SCREEN)

1. Measure +5V
2. Check interlock switches
3. Shorted diode in P.S. rectifier
4. Change synch board

VIDEO (SHAKE)

1. Adjust T.V. controls
2. Change crystal/4024 I.C. on synch board

MOTION

1. Check control panel switches
2. Switch motion boards — if problem persists on same side (ie. black or white plane) change memory board

SCORING

1. Change memory board

Important: Severe damage will occur if any board but the synch board is inserted in synch board socket.

1. Check control panel switches
2. Switch motion boards — if problem persists on same side (i.e., black or white plane) change memory board

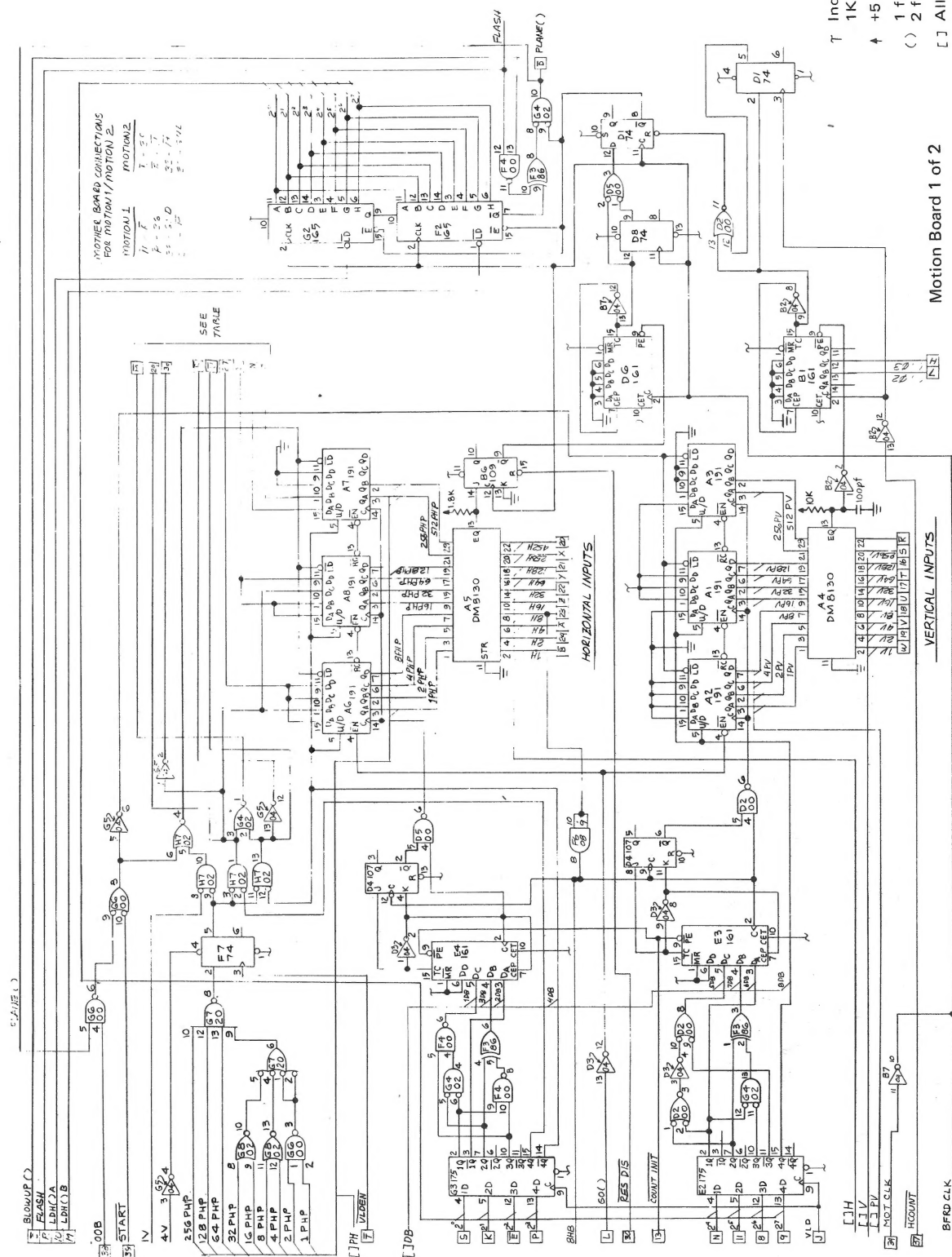
PRICE LIST

PARTS LIST

PART #	DESCRIPTION	UNIT PRICE
300-200	Power Supply	75.00
500-206	Mother Board	75.00
500-201	Motion Board	250.00
500-202	Synch Board	250.00
500-204	Memory Board	250.00
500-200	Set of PC Boards w/Cage	750.00
600-200	Control Panel	75.00
400-100	Coin Door Assembly	55.00
34-64581	P.S. Rectifier	10.29
36-LM309	P.S. Voltage Regulator	3.54
42-0019	19" Monitor, Motorola	295.00
41-5006	Speakers	5.70
46-0051	Switch, Cherry, E51	2.82
46-0903	Fire Button, Switch	1.59
47-0001	Coin Counter	9.72
82-0001	P.S. Transformer	42.75
35-14318	Crystal 14.318 MHZ	5.04
37-4024	4024 I.C.	6.69
32-2N6246	2N6246 Power Transistor	3.69

Minimum Order - \$25.00

SCHEMATICS



↑ Indicates pull up to +5 thru 1K RES.

4 +5

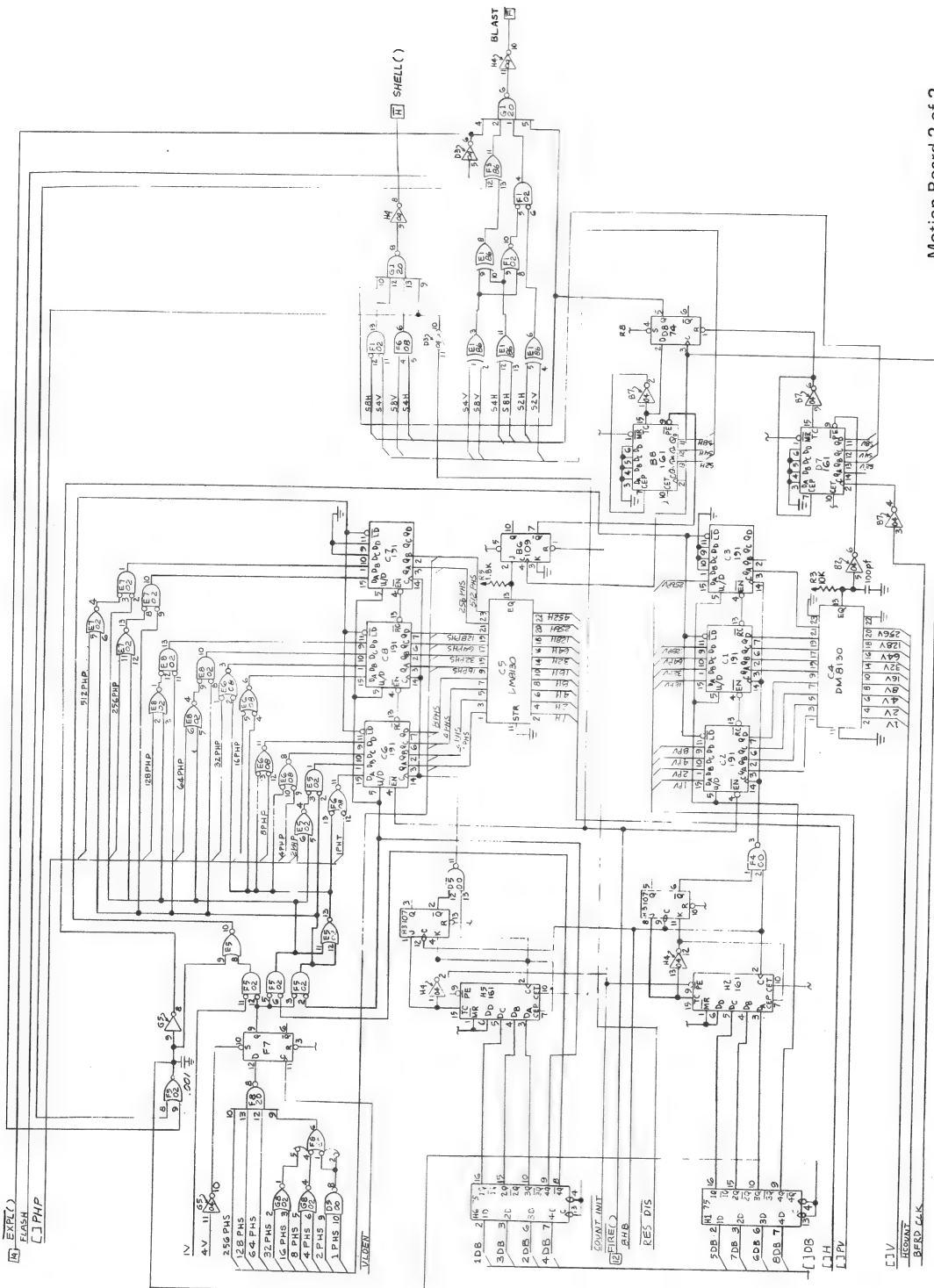
1 for board one.

c) 2 for board two.

2] All signals of similar name

Motion Board 1 of 2

SCHEMATICS



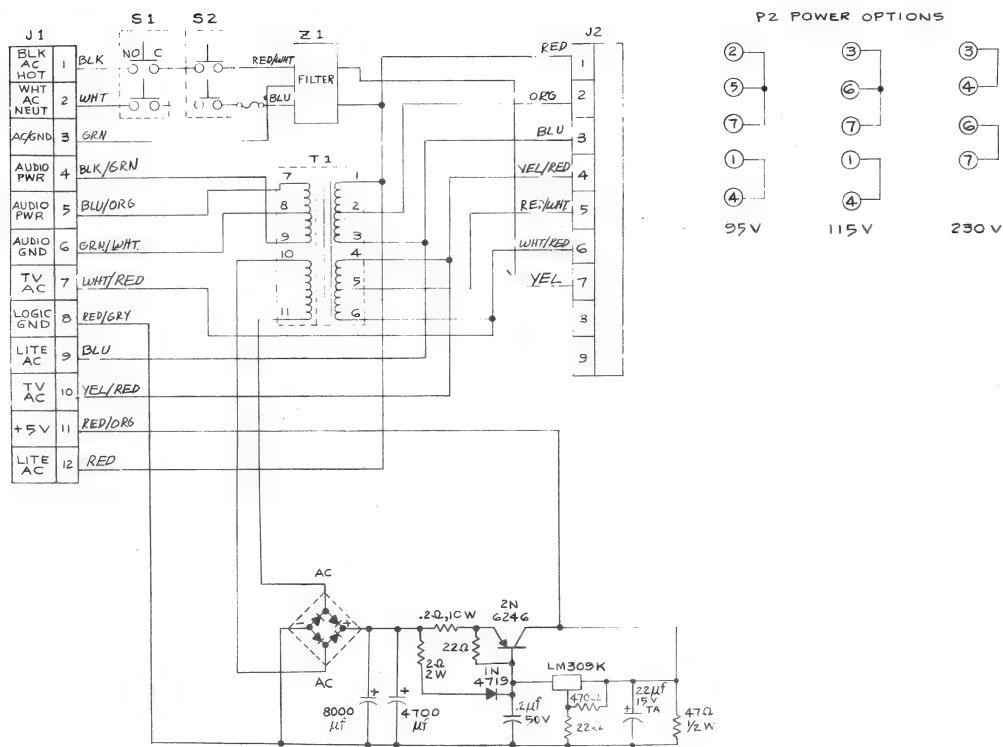
Motion Board 2 of 2

The diagram is a hand-drawn wiring schematic for a pinball machine. It shows the following components and their connections:

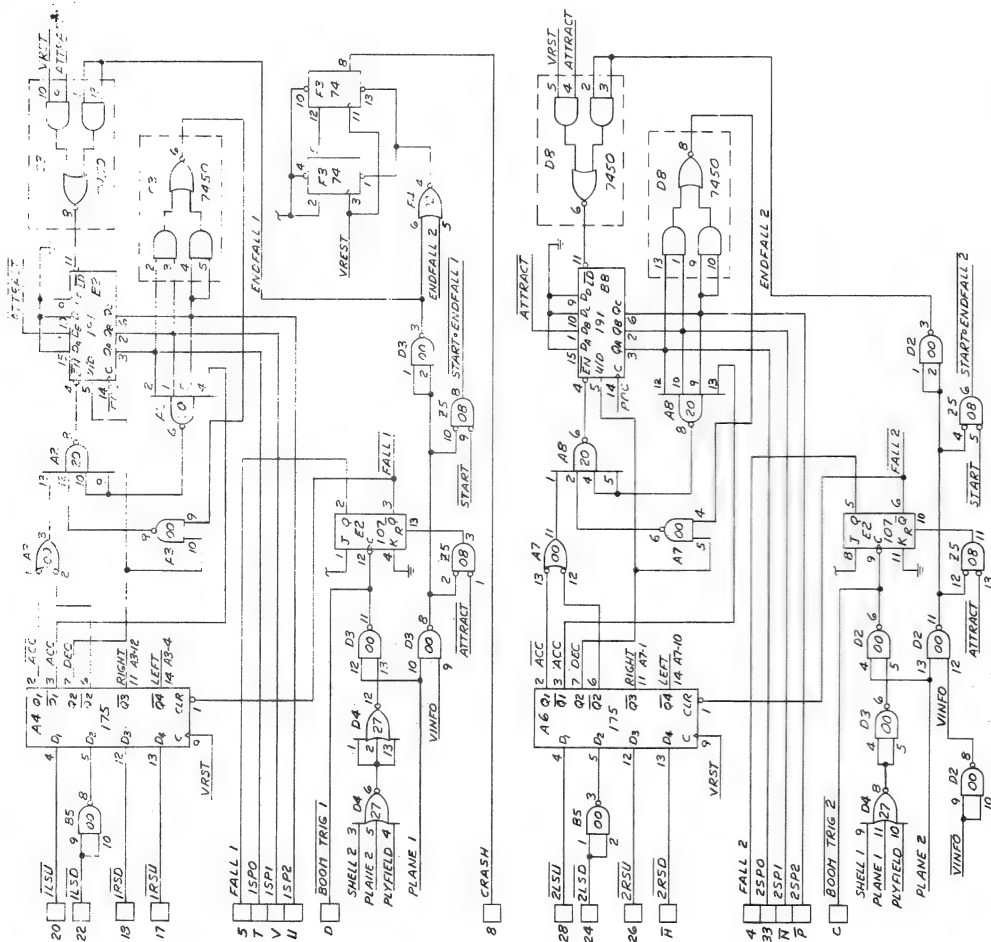
- POWER SUPPLY CONNECTOR:** Located on the left, it has terminals 1, 2, 3, 10, 7, 9, 12, 6, 5, 4, 11, and 8. It is connected to the AC INPUT and the TV MONITOR.
- AC INPUT:** Shows two lines with switches, labeled "INTERLOCK SWITCHES".
- TV MONITOR CONNECTOR:** Located at the top center, it has terminals 7, 2, 10, 9, 1, 3, and 6. It is connected to the power supply and the TV.
- TV:** A box labeled "TV MONITOR" with "CHASSIS GND" and "TV 145 V" connections.
- COIN CTR:** A coin counter unit connected to the TV and the coin switches.
- COIN SWITCHES:** Two switches labeled "COIN SWITCH 1" and "COIN SWITCH 2" connected to the coin counter.
- RELAYS:** Two relays labeled "500V 16A" and "500V 16A" connected to the power supply and the TV.
- SOLENOID:** A solenoid labeled "SOL 12V 12A" connected to the TV and the power supply.
- WIRING:** Numerous lines connect the components, with labels like "1", "2", "3", "10", "7", "9", "12", "6", "5", "4", "11", "8", "A", "B", "C", "D", "E", "F", "G", "H", "I", "J", "K", "L", "M", "N", "O", "P", "Q", "R", "S", "T", "U", "V", "W", "X", "Y", "Z", "1", "2", "3", "4", "5", "6", "7", "8", "9", "10", "11", "12", "13", "14", "15", "16", "17", "18", "19", "20", "21", "22", "23", "24", "25", "26", "27", "28", "29", "30", "31", "32", "33", "34", "35", "36", "37", "38", "39", "40", "41", "42", "43", "44", "45", "46", "47", "48", "49", "50", "51", "52", "53", "54", "55", "56", "57", "58", "59", "60", "61", "62", "63", "64", "65", "66", "67", "68", "69", "70", "71", "72", "73", "74", "75", "76", "77", "78", "79", "80", "81", "82", "83", "84", "85", "86", "87", "88", "89", "90", "91", "92", "93", "94", "95", "96", "97", "98", "99", "100".

At the bottom, there is a legend:

- 1 NORMALLY CONNECTED TO PIN 2. FOR MINIMUM RUB, MOVE TO PIN 18. TANKEES SYNC BONDS REV D OR EARLIER REQUIRE PIN 2 CONNECTION.
- 2 18 GAUGE WIRE
- 3 14 GAUGE WIRE

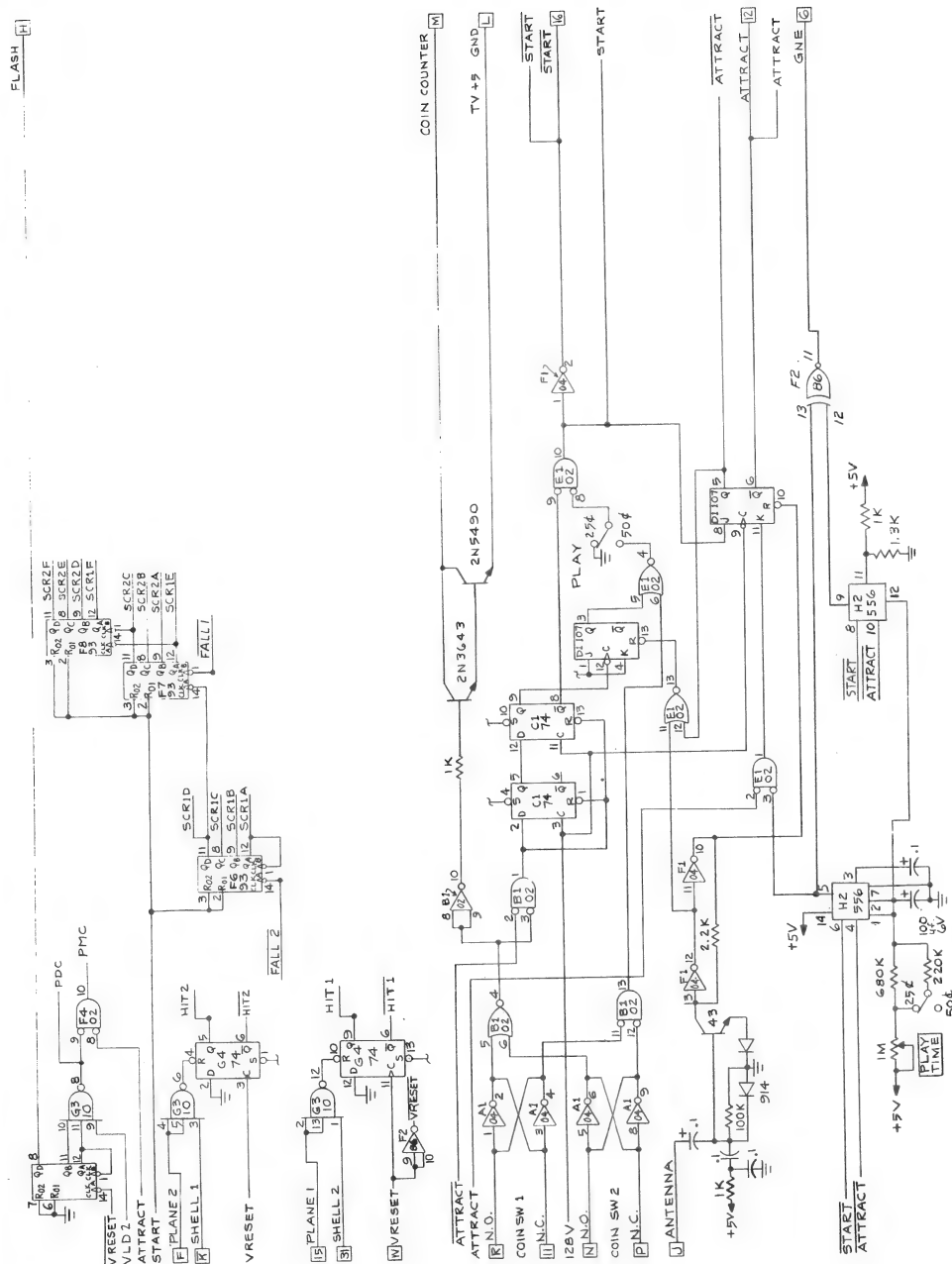


SCHEMATICS



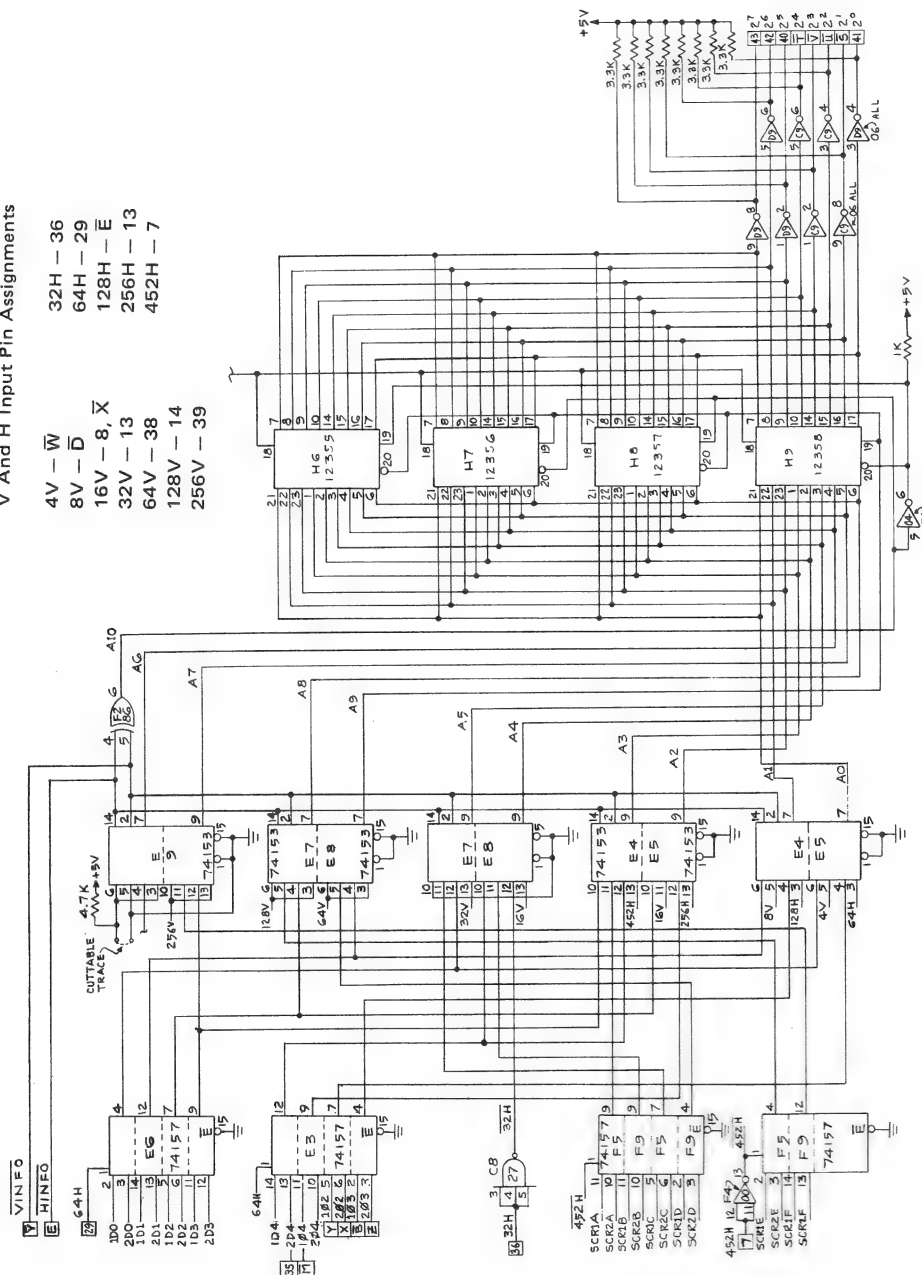
Memory Board 1 of 3

SCHEMATICS



V And H Input Pin Assignments

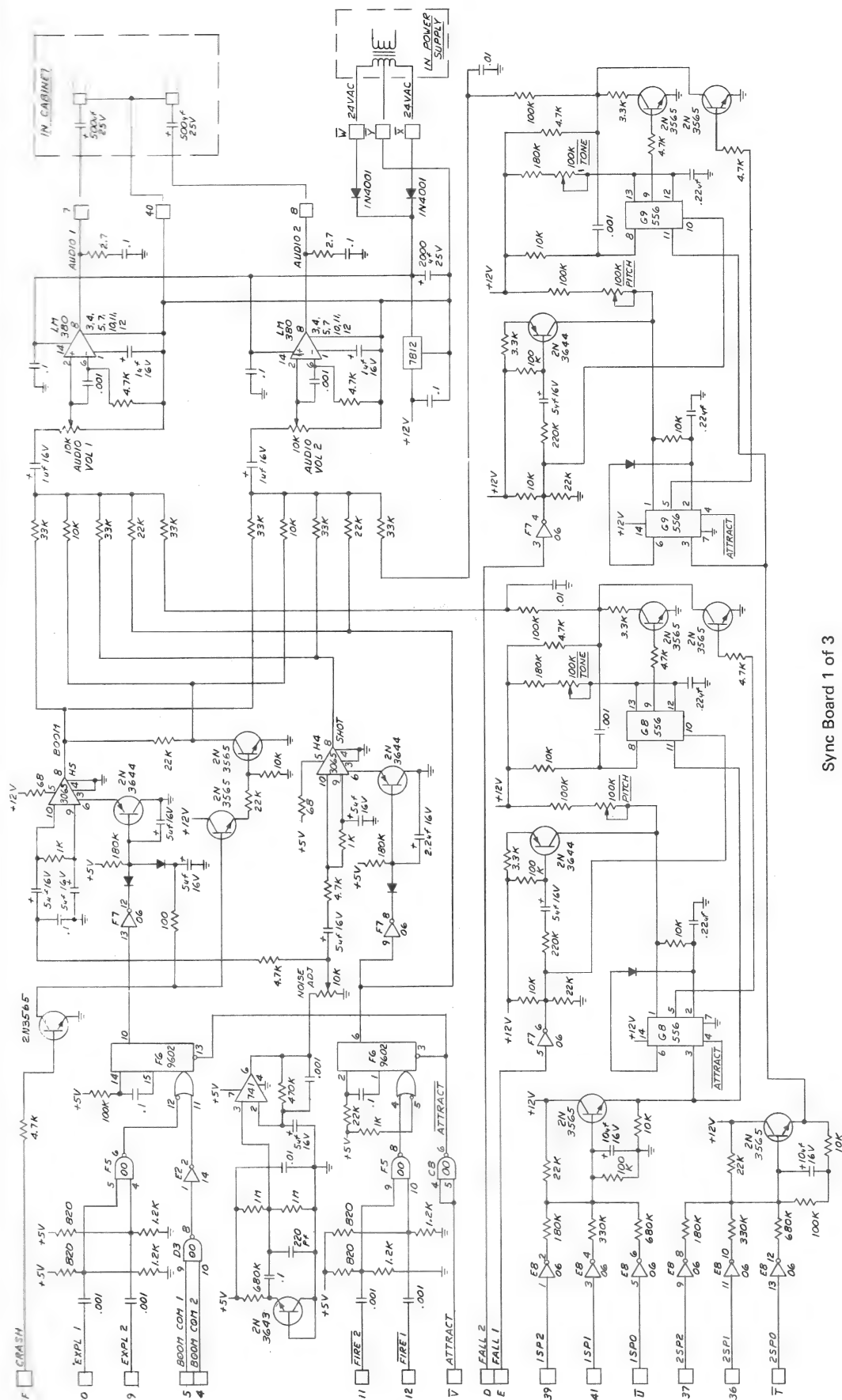
4V - \bar{W}	32H - 36
8V - \bar{D}	64H - 29
16V - 8, \bar{X}	128H - \bar{E}
32V - 13	256H - 13
64V - 38	452H - 7
128V - 14	
256V - 39	



Memory Board 3 of 3

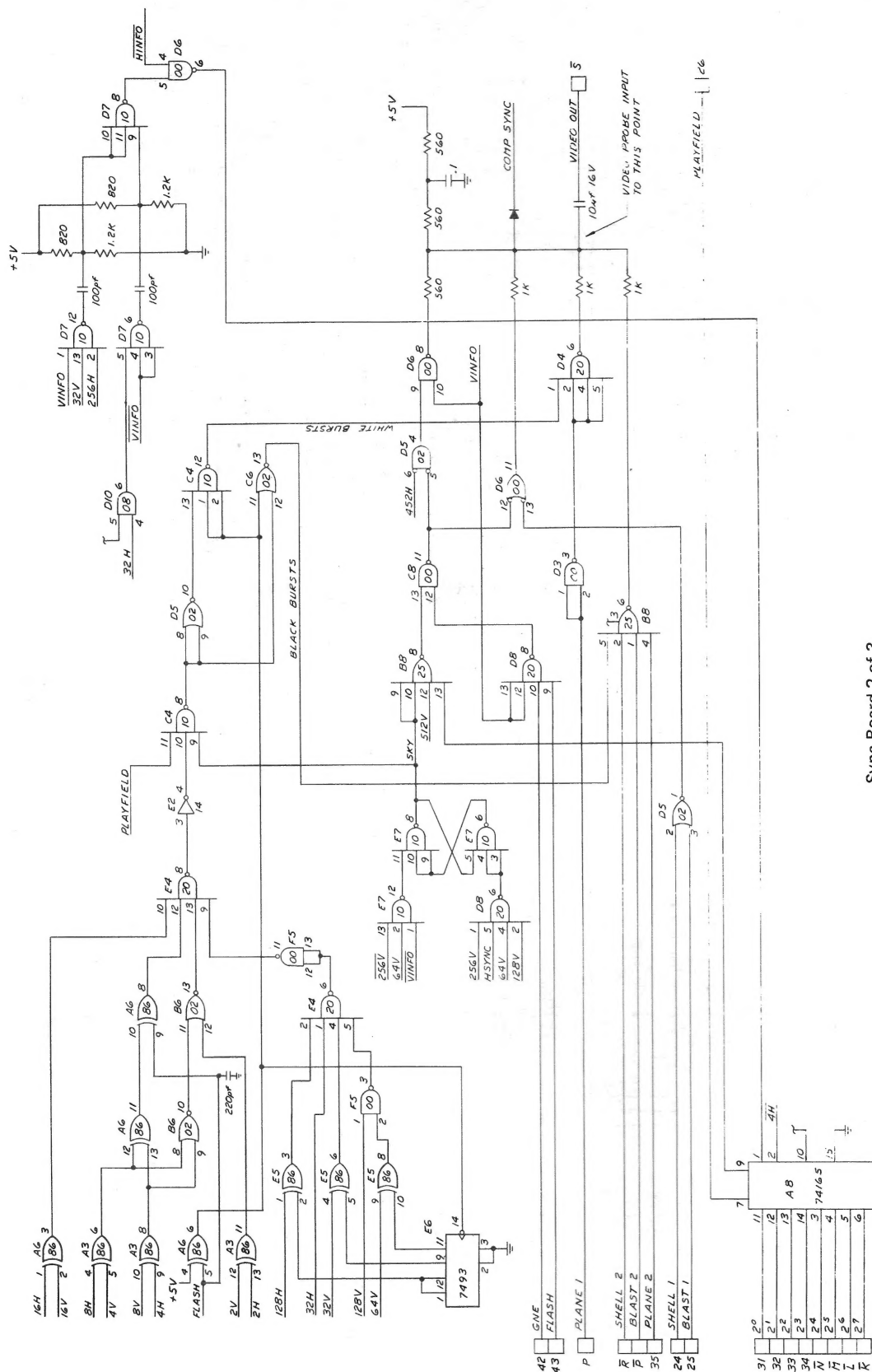
SCHEMATICS

SCHEMATICS



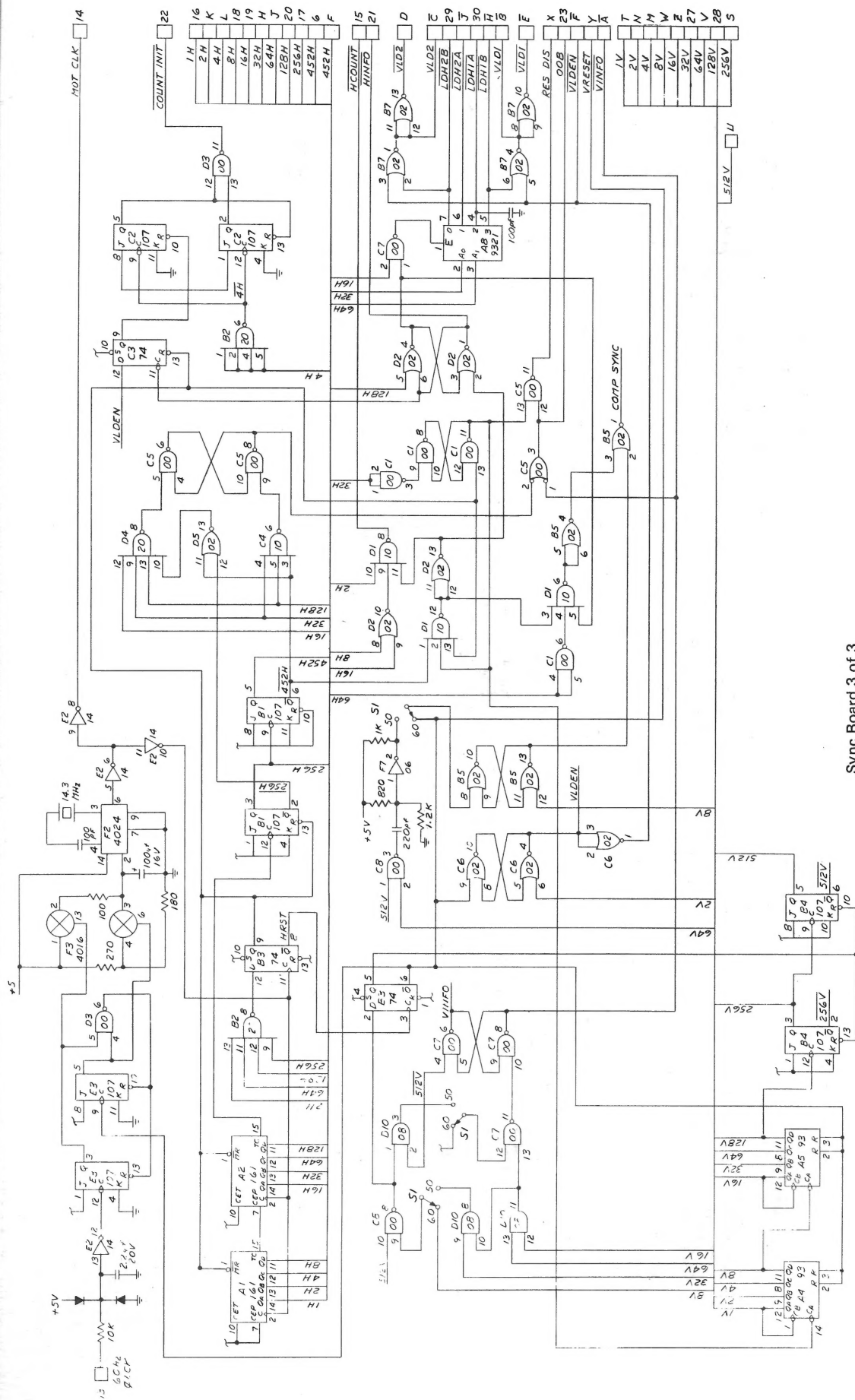
Sync Board 1 of 3

SCHEMATICS



Sync Board 2 of 3

SCHEMATICS



Sync Board 3 of 3

WARRANTY

Fun Games products are warranted by Fun Games for a period of 180 days on the monitor, 90 days on P.C. boards, and 30 days for all other components from the date of shipment against defects in material and workmanship under normal use and operation.

Fun Games' sole and exclusive obligation is to replace or repair any item with any defect warranted against it, provided Fun Games receives written notice of defect during the period of warranty, and any defective item or items of equipment are returned to Fun Games at purchaser's expense. All C.O.D. shipments will not be accepted. The expense of removal and reinstallation of any item is not included in this warranty.

Any replacement during the warranty period will be invoiced at our standard replacement price. This invoice will be due and payable within 30 days. If the defective part is returned to Fun Games within this 30 days, a credit will be allowed. If not returnable to Fun Games in the 30 days, credit will not be allowed.

In no event will Fun Games be liable for any special, incidental, or consequential damages to purchaser or any third party caused by any defective item of equipment whether defect is warranted against or not.

There are no warranties or guarantees, expressed or implied, other than those above.

Fun Games shall have no obligation to make repairs or replacements necessitated by catastrophe, fault or negligence of user.

Supercedes all other warranties expressed or implied.

FUN GAMES INC.

8410 AMELIA ST., OAKLAND, CA 94621 (415) 568-5225